WHAT IS CLAIMED IS:

1. An adaptive equalizing apparatus comprising:

interference canceling means supplied with a received signal, a channel estimation value and an a priori information stream, for canceling an interference component in said received signal;

a filter part supplied with said interference-cancelled received signal, for suppressing interference and for combining multi-path components;

an interference-cancellation-degree estimation part supplied with information based on the state of iteration processing of said received signal, for estimating the degree of interference cancellation;

update timing generating means supplied with at least an iteration start signal, for generating a filter coefficient update timing signal for each period during which the filter coefficients of said filter part are held unchanged; and

filter coefficient calculating means supplied with the degree of interference cancellation, the channel estimation value and said update timing signal, for calculating the filter coefficients of said filter part upon each generation of said update timing signal.

2. The apparatus of claim 1, which further comprises means for calculating a function value which uses, as a variable, that one of received signals obtained by the previous iteration which is to be detected, and wherein:

said interference canceling means is means which is also supplied with said function value and increases the component of said signal to be detected in said received signals; and

said filter coefficient calculating means is means which is also supplied with said function value and calculates calculating filter coefficients.

3. The apparatus of claim 1 or 2, wherein said

degree-of-interference-cancellation estimation part is means which is supplied with the iteration number as said information based on the state of iteration processing and generates the degree of interference cancellation which becomes higher as said iteration number increases.

5   4. The apparatus of claim 1 or 2, wherein said degree-of-interference-cancellation estimation part is means which is supplied with the iteration number as said information based on the state of iteration processing and, upon each generation of said update timing signal, outputs, as the degree of interference cancellation, a function value which uses, as a

10   variable, a priori information from the previous update timing signal to the current update timing signal.

5. The apparatus of claim 4, wherein said degree-of-interference-cancellation estimation part is means which is supplied with the iteration number as said information based on the state of iteration

15   processing and, upon each generation of said update timing signal, generates the degree of interference cancellation based on the function value of said a priori information and said iteration number, said degree of interference cancellation becoming higher as the function value of said a priori information increases and as said iteration number increases.

20   6. The apparatus of claim 2, wherein said degree-of-interference-cancellation estimation part is supplied with the receiving energy per information bit, receiving power, the number of transmit and receive antennas, the number of multi-paths, or encoding ratio, or a combination of them, and uses said input also being used for estimation of the

25   degree of interference cancellation.

7. The apparatus of claim 1 or 2, wherein said update timing generating means is means which is also supplied with said channel

estimation value and outputs said update timing signal each time the difference between the channel estimation value immediately after the previous filter coefficient calculation and the current channel estimation value exceeds a square sum.

5   8. The apparatus of claim 1 or 2, which receives signals from N transmitters and performs turbo equalization for each of signal streams from said N transmitters, said N being an integer equal to or greater than 1;

said apparatus comprising:

n external information value generating parts each of which is

10   supplied with the output from said filter part of each signal stream and calculates an external information value; and

N soft-input soft-output decoders each of which is supplied with said external information value from one of said N external information value generating parts, performs soft-input soft-output decoding by use of

15   redundancy concerning error correction added in an encoder of one of said N transmitters and outputs a decoded bit as a temporary or final received signal, and outputs an external information value or log-likelihood ratio of said bit as said a priori information stream; and

wherein equalization and decoding processes are iterated while

20   updating said a priori information value with new values one after another.

9. The apparatus of claim 8, wherein:

said degree-of-interference-cancellation estimation part is means provided for each of said signal streams and supplied with error detection result information from the corresponding one of said soft-input soft-output

25   decoders, said degree-of-interference-cancellation estimation part outputting the degree of interference cancellation estimated from information based on said iteration processing state when said error detection result information

indicates the presence of an error and outputting a constant as the degree of interference cancellation when said error detection result information indicates the absence of an error.

10. A program for controlling a computer to function as an adaptive equalizing apparatus which comprises:

interference canceling means supplied with a received signal, a channel estimation value and an a priori information stream, for canceling an interference component in said received signal;

a filter part supplied with said interference-cancelled received signal, for suppressing interference and for combining multi-path components;

an interference-cancellation-degree estimation part supplied with information based on the state of iteration processing of said received signal, for estimating the degree of interference cancellation;

update timing generating means supplied with at least an iteration start signal, for generating a filter coefficient update timing signal for each period during which the filter coefficients of said filter part are held unchanged; and

filter coefficient calculating means supplied with the degree of interference cancellation, the channel estimation value and said update timing signal, for calculating the filter coefficients of said filter part upon each generation of said update timing signal.